

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

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In re Application of:	:	Examiner: Trevor McGraw
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Manfred ROESSLER et al.	:	
	:	
For: FUEL-INJECTION VALVE	:	Art Unit: 3752
	:	
Filed: April 14, 2005	:	
	:	
Serial No.: 10/531,407	:	
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 P.O. Box 1450
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 Date: February 3, 2011
 Signature: /Farieza Juman/
 Farieza Juman

APPEAL BRIEF PURSUANT TO 37 C.F.R. § 41.37

SIR:

On December 13, 2010, Appellants filed a Notice of Appeal from the last decision of the Examiner contained in the Final Office Action dated August 20, 2010 in the above-identified patent application.

In accordance with 37 C.F.R. § 41.37, this brief is submitted in support of the appeal of the rejections of claims 7, 13, and 14. For at least the reasons set forth below, the final rejections of claims 7, 13, and 14 should be reversed.

1. REAL PARTY IN INTEREST

The real party in interest in the present appeal is ROBERT BOSCH GMBH of Stuttgart in the Federal Republic of Germany, which is the assignee of the entire right, title and interest in and to the present application.

2. RELATED APPEALS AND INTERFERENCES

There are no other prior or pending appeals, interferences or judicial proceedings known by the undersigned, or believed by the undersigned to be known to Appellants or the assignee, ROBERT BOSCH GMBH, “which may be related to, directly

affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.”¹

3. STATUS OF CLAIMS

Claims 1 to 6 and 8 to 12 have been canceled.

Claims 7 and 13 to 18 pending.

Claims 15 to 18 have been withdrawn from consideration.

Claims 7, 13, and 14 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of U.S. Patent No. 4,245,789 (“Gray”), U.S. Patent No. 5,732,888 (“Maier et al.”), U.S. Patent No. 5,226,975 (“Denton et al.”), and U.S. Patent No. 6,592,947 (“McCane et al.”).

A copy of the appealed claims, *i.e.*, claims 7, 13, and 14 is attached hereto in the Claims Appendix.

4. STATUS OF AMENDMENTS

In response to the Final Office Action dated August 20, 2010, Appellants submitted a “Reply Under 37 C.F.R. § 1.116” on October 26, 2010. The Reply Under 37 C.F.R. § 1.116 did not include any proposed amendments to the claims. It is noted, however, that the Advisory Action dated November 15, 2010 indicates that “[f]or purposes of appeal, the proposed amendment(s) . . . will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended,” despite the fact that no proposed amendments to the claims were included in the Reply Under 37 C.F.R. § 1.116. It is Appellants’ understanding that the claims as included in the annexed “Claims Appendix” reflect the current claims.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 7 relates to a fuel injector for a fuel injection system of an internal combustion engine. Claim 7 recites that the fuel injector includes a solenoid coil 10. *Specification* at page 2, line 34 to page 3, line 1. Claim 7 recites that the fuel injector includes an armature 20 acted upon in a closing direction by a restoring spring 23. *Specification* at page 3, lines 26 to 28. Claim 7 recites that the fuel injector includes a valve

¹ Appellants note that a prior Appeal Brief pursuant to 37 C.F.R. § 41.37 was filed by Appellants on November 25 2008 in support of an appeal from the decision of the Examiner contained in the Final Office Action dated March 19, 2008 rejecting claim 7. However, the Examiner reopened prosecution prior to jurisdiction passing to the Board by issuing a new Office Action dated February 10, 2009.

needle 3, which is connected to the armature 20 by force-locking and at which a valve-closure member 4 is formed, which forms a sealing seat together with a valve-needle surface 6. *Specification* at page 2, lines 30 to 33 and page 3, lines 10 to 12. Claim 7 recites that the armature 20 faces and strikes against a stop face 39 of an inner pole of the solenoid coil 10 by way of an armature stop face 38. *Specification* at page 4, lines 29 to 32. Claim 7 recites that both the armature stop face 38 and the stop face 39 of the inner pole have the same coating 40. *Specification* at page 5, lines 12 to 13. Claim 7 recites that the coating 40 is deposited on the armature stop face 38 and on the stop face 39 of the inner pole in a plurality of chromium layers, the coating having a surface structure with raised areas 42 and recessed areas 43, wherein the raised areas have a dome-shaped design. *Specification* at page 4, lines 23 to 27 and page 5, lines 12 to 13. Claim 7 recites that the height difference between the raised areas and recessed areas is initially between 5 μm and 10 μm and is reduced to between 4 μm and 5 μm during use of the fuel injector. *Specification* at page 5, lines 1 to 9.

6. **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

Whether claims 7, 13, and 14 are patentable under 35 U.S.C. § 103(a) over the combination of Gray, Maier et al., Denton et al., and McCane et al.

7. **ARGUMENT**

Claims 7, 13, and 14 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Gray, Maier et al., Denton et al., and McCane et al. It is respectfully submitted that the present rejection should be reversed for at least the following reasons.

The Examiner admits at page 4 of the Final Office Action that the combination of Gray, Meier et al., and Denton et al. fails to disclose a height difference between raised areas and recessed areas that is initially **between 5 μm and 10 μm** and is reduced to between **4 μm and 5 μm** during use of the fuel injector. The Final Office Action contends, however, that it would have been obvious to provide the coating of Gray, as modified or combined with the teachings of Maier et al. and Denton et al. with raised and recessed areas of 5 to 10 μm as allegedly taught by McCane et al. Appellants disagree.

It is initially noted that the Examiner contends at page 4 of the Office Action that McCane et al. teaches depositing a coating onto a roughened surface that is “5 to 50 μm deep.” McCane et al. does not appear to disclose a roughened surface having this alleged depth.

McCane et al. relates to a galvanization process for parts such as, e.g., automobile bodies and closures such as doors, hoods, deck lids, and lift gates. Col. 5, lines 26 to 30. McCane et al. discloses spraying powders having a size range of 5 to 50 microns having sufficient plasticity to generate dense deposits through impact fusion. Col. 4, lines 18 to 25. Contrary to the assertions in the Final Office Action, *McCane et al. does not in any way disclose or suggest a coating having a height difference between raised areas and recessed areas that is between 5 μ m and 10 μ m.* In this regard, McCane et al. discloses that a powder having a size range of 5 to 50 microns is sprayed onto a surface in such a manner that it deforms and fuses into the surface. See col. 4, lines 18 to 25. There is no disclosure regarding the dimensions of the powder particles after being deformed and fused into the base material, much less the dimensions of the surface after the coating is fully applied. Any contention that the disclosure of McCane et al. results in a coating with raised and recessed areas within the ranges of claim 7 would be based on nothing more than speculation and conjecture, which cannot support an obviousness rejection.

As regards the Examiner's contention at pages 4 to 5 of the Final Office Action that Figure 1 of McCane et al. evidences a height difference between 5 μ m and 10 μ m, it is well-settled that proportions of features in a drawing are not evidence of actual proportions when drawings are not to scale. See In re Wright, 569 F.2d 1124, 193 USPQ 332 (C.C.P.A. 1977). There is no mention in McCane et al. that Figure 1 is drawn to scale, or of any relative height differences related to Figure 1. Thus, the Examiner's reliance on Figure 1 for allegedly evidencing a numeric range of height differences is improper. Moreover, Figure 1 illustrates the components during the application process, not a fully applied coating. See col. 3, lines 9 to 20 and Figure 1.

In the "Response to Arguments" section beginning at page 6 of the Final Office Action, the Examiner, referring to McCane et al., asserts that

Applicant cannot show or prove that all of the particles of the powder that fuse are out of the recited range [between 5 and 10 micrometers]. Examiner notes that it is possible for the particles to be within the recited range after it deforms and fuses to the surface and Applicant's assertions against Examiner's view is also speculation and conjecture.

Initially, the assertion that Appellants cannot show or prove that a reference does not include features of the present claims is entirely improper, since it is well-settled that the *initial*

burden of proof for establishing a prima facie case of obviousness is with the Examiner.

See In re Marosi, 710 F.2d 799, 802, 218 U.S.P.Q. 289, 292 (Fed. Cir. 1983).

As best understood by Appellants, the present rejection relies on a supposedly inherent feature of McCane. However, even if the Examiner's assertion that "it is possible for the particles to be within the recited range" were true—which is not conceded—there would still not be a sufficient showing to establish inherency. In this regard, it is well settled that to rely on inherency, the Examiner must provide a "basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied art." (See Ex parte Levy, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int'f. 1990)). Thus, the case law makes clear that simply because a certain result or characteristic may occur in the prior art does not establish the inherency of that result or characteristic. As such, the present rejection is plainly deficient for at least this additional reason.

Further, even assuming, arguendo, that McCane et al. did teach providing a galvanized coating having a difference between raised and recessed areas of between 5 μm and 10 μm —which it does not—there would still be no apparent reason or rationale in accordance with KSR International Co. v. Teleflex Inc., 550 U.S. 398, 82 U.S.P.Q.2d 1385 (2007) to add such a feature to the coating according to the proposed combination of Gray, Maier et al., and Denton et al. As an initial matter, McCane et al. is directed to a general galvanization process rather than a coating suitable for contact faces of a fuel injector. Moreover, there is no disclosure in McCane et al. of any significance whatsoever to any height difference between any raised and recessed areas of an applied galvanization coating, much less any significance to a coating applied to contact surfaces of a fuel injector.

Further still, Gray—which pertains specifically to a fuel injector—plainly teaches away from any proposed modification of the surface roughness to have raised areas and recessed areas that are within the ranges claimed in claim 7 of the present application. In addition to unambiguously setting forth that the surface 63s of a core of a pole piece 62 should have a surface roughness rating value on the order of 0.4 μm to 0.8 μm , Gray also sets forth that ***"the surface 73s of the armature 73 can have a roughened surface texture over its entire surface area of a roughness average rating value of 8 to 12 microinches (0.20 to 0.30 micrometers) maximum"*** (emphasis added). Using the definition of the roughness rating disclosed in Gray at col. 8, line 63 to col. 9, line 10, this would indicate a peak-to-valley average on the order of ***0.4 μm to 0.6 μm maximum***. Thus, even if McCane et al. taught a height difference between raised and recessed areas of between 5 μm and 10 μm —

which, as set forth above, it does not—this feature would not have been an obvious modification to the fuel injector of Gray, alone or in combination with Maier et al. and Denton et al. Indeed, it appears that the proposed modifications to the fuel injector of Gray are based on nothing more than hindsight reasoning.

At page 7 of the Final Office Action, the Examiner further asserts that:

[w]ith regard to Applicant's arguments that Gray teaches away from having raised and recessed areas, Examiner likes to again reminded [sic] Applicant that the application of the coating of Meier et al onto the dome shaped rough surface of Gray would also permit improved prevention hydraulic [sic] sticking of the armature and pole piece surfaces of Gray and the height of the raised and recessed areas of Gray would increase to 10 μm as a result of Maier et al coating.

Initially, it is apparent that the Examiner is asserting that applying a “coating thickness . . . generally measur[ing] between 10 and 25 μm ” would lead to a height difference between raised and recessed areas that is within the claimed range. However, Meier et al. does not disclose a thickness that varies within a given coating, much less a difference within the ranges claimed in the present application.

Moreover, the Examiner's argument that the combination would somehow lead to a coating having a height difference between raised and recessed areas within the claimed ranges—which it does not—does not in any way address the fact that Gray—which pertains specifically to a fuel injector—plainly teaches away from any proposed modification of the surface roughness to have raised areas and recessed areas that are within the ranges claimed in claim 7 of the present application, as set forth in greater detail above.

As indicated above, the combination of Gray, Maier et al., Denton et al., and McCane et al. plainly fails to disclose, or even suggest all of the features of claim 7. Accordingly, the combination of Gray, Maier et al., Denton et al., and McCane et al. plainly fails to render unpatentable claim 7 or either of claims 13 and 14, which depend from claim 7. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988) (any dependent claim that depends from a non-obvious independent claim is non-obvious).

As further indicated above, the present rejection of claims 7, 13, and 14 is not supported by a proper rationale in accordance with the requirements of KSR International Co. v. Teleflex Inc., 550 U.S. 398, 82 U.S.P.Q.2d 1385 (2007). Thus, the present rejection is deficient for at least this additional reason.

In view of all of the foregoing, it is readily apparent that the Final Office Action fails to establish a prima facie case of obviousness consistent with KSR International Co. v. Teleflex Inc., 550 U.S. 398, 82 U.S.P.Q.2d 1385 (2007). Accordingly, reversal of the present rejection is respectfully requested.

8. CLAIMS APPENDIX

A “Claims Appendix” is attached hereto and appears on the one (1) page numbered “Claims Appendix.”

9. EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R. §§ 1.130, 1.131 or 1.132. No other evidence has been entered by the Examiner or relied upon by Appellants in the appeal. An “Evidence Appendix” is nevertheless attached hereto and appears on the one (1) page numbered “Evidence Appendix.”

10. RELATED PROCEEDINGS APPENDIX

As indicated above in Section 2, above, “[t]here are no other prior or pending appeals, interferences or judicial proceedings known by the undersigned, or believed by the undersigned to be known to Appellants or the assignee, ROBERT BOSCH GMBH, ‘which may be related to, directly affect or be directly affected by or have a bearing on the Board’s decision in the pending appeal.’” As such, there are no “decisions rendered by a court or the Board in any proceeding identified pursuant to [37 C.F.R. § 41.37(c)(1)(ii)]” to be submitted. A “Related Proceedings Appendix” is nevertheless attached hereto and appears on the one (1) page numbered “Related Proceedings Appendix.”

11. CONCLUSION

For at least the reasons indicated above, Appellants respectfully submit that the art of record does not disclose or suggest the subject matter as recited in the claims of the above-identified application. Accordingly, it is respectfully submitted that the subject matter as set forth in the claims of the present application is patentable.

In view of all of the foregoing, reversal of all of the rejections set forth in the Final Office Action is therefore respectfully requested.

Respectfully submitted,

Dated: February 3, 2011

/Clifford A. Ulrich/
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CLAIMS APPENDIX

7. A fuel injector for a fuel injection system of an internal combustion engine, comprising:

a solenoid coil;

an armature acted upon in a closing direction by a restoring spring; and

a valve needle, which is connected to the armature by force-locking and at which a valve-closure member is formed, which forms a sealing seat together with a valve-needle surface, the armature facing and striking against a stop face of an inner pole of the solenoid coil by way of an armature stop face,

wherein both the armature stop face and the stop face of the inner pole have the same coating,

the coating being deposited on the armature stop face and on the stop face of the inner pole in a plurality of chromium layers, the coating having a surface structure with raised areas and recessed areas, wherein the raised areas have a dome-shaped design and the height difference between the raised areas and recessed areas is initially between 5 μm and 10 μm and is reduced to between 4 μm and 5 μm during use of the fuel injector.

13. The fuel injector of claim 7, wherein the coating is applied onto a substantially flat surface of the armature, thereby providing the raised areas and recessed areas.

14. The fuel injector of claim 7, wherein the raised areas are formed by depositing a greater thickness of chromium in the raised areas compared to the recessed areas.

EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R. §§1.130, 1.131, or 1.132. No other evidence has been entered by the Examiner or relied upon by Appellants in the appeal.

RELATED PROCEEDINGS APPENDIX

As indicated above in Section 2 of this Appeal Brief, “[t]here are no other prior or pending appeals, interferences or judicial proceedings known by the undersigned, or believed by the undersigned to be known to Appellants or the assignee, ROBERT BOSCH GMBH, ‘which may be related to, directly affect or be directly affected by or have a bearing on the Board’s decision in the pending appeal.’” As such, there are no “decisions rendered by a court or the Board in any proceeding identified pursuant to [37 C.F.R. § 41.37(c)(1)(ii)]” to be submitted.